area, particularly to the south-east, northerly winds ruled, and as a consequence temperatures fell below the normal. Thus at Algiers during these days temperature was constantly under the mean, varying from 2°·9 to 6°·5, the whole period showing a mean deficiency of 5°·0; and from the 13th the mean deficiency was 3°·8 at Malta, and 5°·6 at Constantinople. On the other hand, over the north of Europe, which was during this time outside the calm anticyclonic centre, and marked with moderate barometric gradients, westerly and southerly winds prevailed, in some cases in considerable force, as on the occasion when a storm appeared in the Arctic Sea to the north. This region was therefore characterised almost throughout by abnormally high temperatures, the mean excess at Haparanda, at the head of the Gulf of Bothnia, being 21°·9 for the week ending Saturday last.

Thus, with barometers equally, or all but equally high the most diverse temperatures prevailed, the conditions determining the temperature in any locality not being the height of the barometer but the position of the locality with reference to the areas of high and of low pressure which prevailed over Europe at the time; or putting the result into the simplest words, it was not the height of the barometer, but the direction and force of the wind, which determined the temperature.

The highest barometer noted in the Weather Charts as having occurred in the British Islands during this time was 30·970 inches at 8 a.m. of the 18th at Oxford. Higher barometers than this even were recorded in 1808, at Gordon Castle, Banffshire, by Mr. James Hoy, he having noted 31·007 inches at 9 p.m. of February 24 of that year; and again 31·046 inches at 11 p.m. of January 8, 1820, this last reading being in all probability the highest reading yet recorded in these islands.

MR. MIVART ON THE CAT

The Cat. An Introduction to the Study of Backboned Animals, especially Mammals. By St. George Mivart, Ph.D., F.R.S. With 200 Illustrations. (London: John Murray, 1881.)

THE author of the present volume tells us in his preface that it "is expressly intended to be an introduction to the natural history of the whole group of *backboned animals;* but the subject has been so treated as to fit it also to serve as an introduction to Zoology generally, and even to Biology itself." By serving as a guide to the structure, as ascertained by dissection, and natural history of the cat, it will, it is hoped, "give the earnest student of biology the knowledge of anatomy, physiology, and kindred sciences which is necessary to enable him to study profitably the whole class" of Mammals, the natural history of these generally being, we are told, to be treated of in a companion volume.

After a somewhat careful study of the bulky volume of 550 pages before us, it is with some regret that we doubt if Prof. Mivart's intentions are likely to be realised, as, trying to attain two very desirable ends, it is not evident that he has succeeded in either.

The student of anatomy will, we think, find that much of the descriptive part of the present work is too sketchy to be of real service as a text-book of Mammalian anatomy, and the almost complete absence of references—even to Strauss-Durckheim's elaborate "Anatomie descriptive et comparative du Chat," published, with excellent illustrations, at Paris so long ago as 1845—also seriously detracts from its value in this respect. On the other hand, any one taking it up with a view to understanding the main principles and objects of biological science will, even if he succeed in his endeavour, be liable we fear to be disgusted by the large amount of "dry" and quite unreadable detail contained in it. Nor can we always speak very highly of the accuracy and style displayed in the volume in question.

After an introductory chapter, eight chapters are devoted to the consideration of the various organs of the cat, the anatomical structure of each system being accompanied by an account of its histology and functions. As already indicated, the descriptions of many of the parts concerned strike us as rather too brief and wanting in preciseness, whilst in some parts that we have tested we find considerable omissions. Thus in the account of the cranial nerves in Chapter IX. we find no mention of such interesting nerves as the vidian and recurrent laryngeal; in the myological portion, no account at all is given of the important subject of the nerve-supply of the various muscles described, which is only indicated later on when considering the distribution of the nerves themselves.

With regard to the histology of the various tissues, it would be more satisfactory as convincing the reader that it *is* the cat, and not some other mammal the structure of which is being described, if the illustrations were not so frequently taken from the pig or the well-known figures of Quain's Anatomy.

Chapter X. is devoted to the "Development of the Cat," and here it would have been still more desirable that the author should have stated explicitly how much, or how little, of its contents apply to the cat, or at least have given references to the authorities for some of his statements. The account given seems, as far as we can judge, intended to be a *résumé* of the principal facts ascertained as regards the development of *Mammalia* generally, but if so some of the views put forward are rather startling.

Thus on p. 320 we are told that "the first indication of the embryo is the appearance of a longitudinal depression or furrow, termed the *medullary groove.*" Fig. 145, to which reference is made, pretty clearly shows that what is meant is, in reality, the *primitive streak* (in fact it is called, in the explanation, though *not* in the description, of that figure the "primitive groove")—a structure of quite a different order and significance, as surely Prof. Mivart must know, from the real medullary groove. The heart is said to be formed by "*one* vessel, tubular and rhythmically contractile"; in fact, in Mammals, as in Birds, it always arises from *two* tubes, which only unite subsequently (Cf. Balfour's "Embryology," vol. ii. pp. 522, 523). In the account of the development of the nervous system the statement made that "the white matter of the spinal cord is formed by transformation of the cells of the adjacent MESOBLAST" (p. 356), is quite opposed to all that we know of the development of that system in Vertebrates, and we are left to infer that the "mass of the nerves" are also derived from mesoblast, in contradiction to the observation and views of our most distinguished embryologists. The account of the deve-

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lopment of the urinary organs and suprarenal bodies (pp. 350, 351) also leaves much to be desired.

After a chapter on the "Psychology of the Cat," Prof. Mivart devotes one to the different kinds of cats, living and extinct. Of the living species he recognises fifty, forty-eight of which are included in *Felis*, the other two being the two species of Cheetah (*Cynælurus*). We are glad to see that Prof. Mivart does not recognise the various genera *Leo*, *Tigris*, *Uncia*, &c., proposed by the late Dr. Gray, which have been adopted by some recent naturalists. The Ounce (*F. uncia*) is stated (p. 396) to occur near Smyrna; but we believe the sole authority for this is the identification by the late Mr. Blyth, who was followed by Gray, Jerdon, and others, of the *Felis tulliana* of Valenciennes with the true *F. uncia* of the central tablelands of Asia. According to the latest authorities *F. tulliana* is certainly *not* the Ounce, and is, in all probability, only a long-haired and pale-coloured Leopard (*F. pardus*).

Chapter XIII. is devoted to the "Cat's Place in Nature," a consideration of the relationships of the *Felidæ* to other Carnivora, and organic forms generally. In the enumeration of the characters of the three great groups of Fissiped Carnivora, we miss any allusion to their well-marked cerebral differences, clearly pointed out by Prof. Flower, and on which the late Prof. Garrod laid so much stress. "Aard-vark," we may mention, is the Dutch name for the *Orycteropus*, not for *Proteles*, as stated on p. 483. The cat's hexicology (or its relations to its environment) occupies the next chapter, and the concluding one deals with the problems of the origin and pedigree of the animal. In treating of the main zoological regions of the globe (pp. 497-500) it is not clear by what exact criterion Prof. Mivart has been guided in selecting forms representative of those regions. Neither mules (why introduce such artificial products as hybrids at all in such a connection?) nor chameleons can be considered as specially characteristic of the "Palæarctic" region, nor should we have noted the absence of "true grouse" or the presence of "the mocking-bird" as peculiarities of the "Ne-arctic" one. Why, too, call *Hyomoschus* the "aquatic musk-deer" (p. 498), when on p. 467 Prof. Mivart has correctly characterised the chevrotains as "very small animals, commonly called *in error* musk-deer"?

The book, we must add, is on the whole got up in very good style, both as regards type, paper, and illustrations. Of the latter there are over 200 woodcuts, many of them original, and including a nice series of figures of some of the less known species of *Felidæ*, as well as of skulls of some of the more remarkable North American extinct *Æluroidea*. It is to be regretted, however, that the volume should be disfigured by numerous misprints, most of them of well-known names. Thus we have *Potam*a*gale* and *Pot*o*mogale*, *Arctitis*, *Must*i*lidæ*, *Amphi*nam*a*, "Horned-senamer" (for -screamer), *T*e*niada*, *Greg*o*rinidæ*, &c. Fort Bridger, a locality in Wyoming Territory, well known for its vertebrate remains, appears as Fort Bridge*s* (p. 512) and also as "Fire Bridge" (p. 506)! Prof. Mivart, too, is not consistent in his spelling; thus we have Bali and Bally, and *Ai*lurus, *Ai*luropus, &c., succeeded almost immediately by *Ae*luroidea, Pseud*æ*lurus, &c. Lastly, it is a pity that the author does not always give his references in full, or even get the titles of the journals quoted correctly: thus on p. 331 we notice the "Quarterly Journal of Microscop*ic* Science, and Schäfer's Proceedings of the Royal Society" (*sic*).

W. A. FORBES

CRYSTALLOGRAPHY

Rammelsberg's Handbuch der Krystallographisch-Physikalischen Chemie. Vol. I. (Leipzig: W. Engelmann, 1881.)

THIS volume may to a certain extent be regarded as the first part of a new edition of Prof. Rammelsberg's two previous works on the same branch of science ("Handbuch d. Kryst.-Chemie, 1855; and "Die Neuesten Forschungen im Gebiete der Kryst.-Chemie," 1857). The development of its plan and the wealth of material entitle it, however, to rank as a new work, and has necessitated its division into two parts, of which the present one deals with the elements and inorganic compounds. Of late years much work has been done in the investigation of the physical properties of the artificial substances obtained in our chemical laboratories, the account of which is dispersed through the various scientific periodicals often in such a way as to render it all but impossible to find out whether any investigations have been made of the physical properties of a particular substance. The present work will therefore be highly welcome to both chemists and physicists who are interested in this their common province, and as a book of ready and easy reference will be a great boon to all researchers. The aim of the book is to give in as condensed a form as possible all the physical properties of artificial substances as far as they have been determined, in addition to the crystallographic characters which are often the only ones known. Thus the optical constants, the dilatation under change of temperature as determined by Fizeau, the electrical, magnetic, and other properties of each substance are given wherever known. In fact it aims at doing for artificial substances what has been already done for minerals in Miller's and Des Cloizeaux's "Treatises on Mineralogy." In addition the references to the original memoirs on each property are placed directly after the account of this property. Prof. Rammelsberg's reputation for the thoroughness of his work has been so long established that it seems almost impertinent to praise the excellent way in which he has here carried out his intention. He has produced a book which will not only be in every chemist's and physicist's library, but one which will be continually consulted by them. After dipping into the book in numerous places only one substance has been met with which seems inadequately treated, and this is antimony iodide, than which few substances are more interesting to the crystallographer. The account of the modifications and their relations is in this case scanty and imperfect, and the reference to Prof. Cooke's elegant research on them is wanting in precision.

Prof. Rammelsberg adopts the Weissian system of notation in his Crystallography, but this not in its entirety, as he uses sub-multiple—and not multiple—indices, as was done by Weiss. In the last paragraph of his introduction he states his opinion that the Weissian system is superior to those both of Naumann and of Miller, and he ends by declaring that crystallography would have been

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